

**INFLUENCE OF THE INDICATIONS  
AND OUTCOMES OF PREVIOUS  
CESAREAN SECTION ON  
PLANNED MODE OF DELIVERY IN  
WOMEN WITH ONE PREVIOUS  
CESAREAN SECTION**

**THESIS SUBMITTED IN PARTIAL  
FULFILLMENT OF THE  
REQUIREMENT FOR MASTERS OF  
MEDICINE IN OBSTETRICS AND  
GYNAECOLOGY**

**UNIVERSITY OF NAIROBI**

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**DECLARATION**

This is to declare that this is my original work and has not been presented for any academic award in any other university.

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## DEFINITION OF TERMS

**Cesarean Section:** A cesarean section is a surgical procedure in which incisions are made through a woman's abdomen and uterus to deliver her baby.

**Elective Cesarean Section:** The caesarean section is planned and done on a specific date chosen before the onset of labour.

**Emergency Cesarean Section:** The caesarean section is performed once labour has commenced.

**Primary Cesarean Section:** Cesarean section performed on a patient who has previously never had a cesarean section.

**Repeat Cesarean Section:** Cesarean section performed on a patient who has previously had at least one cesarean section.

**Trial of Labour After Cesarean (TOLAC):** The attempt to deliver vaginally after a cesarean section.

**Vaginal Birth After Cesarean (VBAC):** Delivering a baby vaginally after a previous baby has been delivered through caesarean section.

**TOLAC:** May result in either a “successful” VBAC or a “failed” trial of labor resulting in a repeat cesarean delivery.

**Induction Of Labour (IOL):** Artificial initiation of labour.

## LIST OF ACRONYMS

ANC	Antenatal Clinic
ACOG	American College of Obstetricians and Gynecologists
BMI	Body Mass Index
CS	Cesarean Section
ERCS	Elective Repeat Cesarean Section
FANC	Focused Antenatal Care
IOL	Induction Of Labour
KDHS	Kenya Demographic and Health Survey
KNH	Kenyatta National Hospital
SVD	Spontaneous Vaginal Delivery
TOLAC	Trial of Labor After Cesarean
VBAC	Vaginal Birth After Cesarean
WHO	World Health Organization



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## ABSTRACT

**Background:** Primary caesarean sections (CS) are on the increase worldwide. This means increasing number of women with previous cesarean section(s) are seen antenatally for subsequent delivery. There is paucity of data on the levels of maternal knowledge about the indications of previous cesarean delivery and its outcome, and how it influences the choice of birth plans in subsequent pregnancies.

**Objective:** To determine whether a decision on mode of delivery has been made by 36-40 weeks gestation in women with one previous cesarean section.

**Methods:** Cross sectional hospital based study conducted at Kenyatta National Hospital ANC clinic. The study recruited 169 women with single previous CS at 36 weeks to 40 weeks gestation. Data were collected using questionnaires administered to subjects during face-to-face interviews after obtaining written informed consent.

**Data Analysis:** Data analysis was conducted using SPSS version 19.0. Descriptive univariate statistics [mean (SD), for continuous data and frequency distribution (percentages) for categorical data] were used to summarize sample characteristics. The percentage of women with good understanding of the indications for previous cesarean and proportion with a decision on mode of delivery were calculated and Chi square test of independence used to compare percentages (P value < 0.05 was considered significant).

Any association between indications of previous CS and decision on planned mode of delivery was analysed.

**Findings:** The mean age of women was 29 years (SD = 4), age range 21-40 years. Most women had secondary level of education 78 (46.7%), and 117 (67.5%) mothers had one living child. Most (167, 98.8%) mothers with a single previous scar had delivered through CS during the last pregnancy while 2 mothers (1.2%) had a normal delivery after a

previous cesarean section. Poor progress of labour 44 (26%) and NRFS 44 (26%) were the leading causes for CS. Overall, for the index pregnancy, assessment of three issues was determined: doctor/nurse led discussion on mode of delivery (100%); substantive decision making on mode of delivery (100%) and knowledge of expected date of delivery (84.6%). All these three were significantly associated with marital status ( $p = 0.015$ ) but not associated with the remaining client characteristics ( $p > 0.005$ ).

The knowledge on the indications of previous cesarean were grouped in non recurrent and recurrent indications. There was no association between recurrent indications and elective repeat cesarean section as the planned mode of delivery.

**Conclusion And Recommendations:** Approximately 85% ANC clients with one previous caesarean section at KNH have a definite decision on mode of delivery by 36 – 40 weeks gestation. These findings are consistent with existing literature in similar settings and the fact that 15% of pregnant women did not have a definite decision on mode of delivery serves to highlight the need for continued inclusion of pregnant women in the planning of care and specifically decision making related to delivery mode.

The fact that there was no association between recurrent indications for previous CS and ERCS as the planned mode of delivery points to poor decision making and the need for guidelines based on current literature when counseling women with one previous cesarean section and helping them choose appropriate plan on mode of delivery.

## CHAPTER ONE

### INTRODUCTION AND LITERATURE REVIEW

#### 1.1 Introduction

Pregnancy, delivery and early parenthood are extremely important life experiences that directly affect many families. Child delivery can occur either via the vaginal route or by cesarean delivery. In the recent past caesarean section (CS) rates have been increasing steadily throughout the world <sup>1</sup>. This is despite the World Health Organization (WHO) recommending that the rates be maintained at 10-15% <sup>2</sup>.

The introduction of CS in clinical practice was as a life saving procedure for both the mother and the baby. There are studies that show an inverse relation between CS rates and maternal and infant mortality in developing countries where large sectors of population suffer due lack of access to basic obstetric care <sup>3</sup>. Nevertheless, it is argued that CS above the recommended rates shows no additional benefit for the mother and the baby. To the contrary, high rates of CS could be directly linked to negative repercussions in maternal and child health <sup>4</sup>.

Elective repeat CS (ERCS) contributes greatly to the high CS rate <sup>5</sup>. It is important to note that despite having undergone a CS, vaginal birth after caesarean (VBAC) is still possible for many women. Despite this, the number of women attempting trial of labour after caesarean (TOLAC) remained low <sup>6</sup>. Several studies show that, though many women may prefer caesarean section as their mode of delivery, the majority of women prefer to deliver their babies vaginally. The women who preferred caesarean section are more likely to have undergone a previous caesarean section <sup>7</sup>.

Amongst women with at least one CS, their childbirth experiences influence their future birth plans. The nature of women's attitudes and related knowledge gained after

undergoing a CS is important in determining the mode of delivery for subsequent births. Based on her current and past obstetric history a woman should be informed on her chances of the possible birth plans and their associated risks <sup>8</sup>. As such health care providers and physicians should uphold their code of ethics while imparting knowledge on the delivery options available for a woman who has undergone a previous CS. By so doing, the patients can use this information to make informed decisions.

## **1.2 Literature Review**

### **1.2.1 Overview**

Globally, the rate of CS has been on the increase especially in the high and middle income countries, where many women have a choice of how their baby is to be delivered <sup>9</sup>. It is estimated that over 18.5 million CS occur annually in the world. Cyprus is considered to have highest rates of CS at 50% and Chad has the least number of CS rate at 0.4%, while the global rate is pegged at 20%.

In Kenya, 43 percent of births occur in a health facility while 56 percent take place at homes <sup>10</sup>. Overall, all the births occurring in Kenya only 44% of them occur under the supervision of skilled birth attendand, usually a nurse or a midwife. The 2008-2009 KDHS also documents that 6% of all births are delivered by cesarean section, the rest being delivered through the vaginal route.

A study at the Aga Khan University Hospital Nairobi documented a steady rise in the rate of cesarean section from 20.4 percent to 38.1 percent in the years 1996 to 2004 <sup>11</sup>.

The increasing rate of CS in the last two decades has been attributed predominantly to non obstetric factors such as increasing use of birth technology, fear of litigation, financial incentives and preference of physicians. On the other hand, there are women

who request CS out of their own volition <sup>12</sup>. History of a CS is the most common obstetric factor that has been considered to lead to increased rate of CS in the world.

Several studies indicate that the knowledge and experience that women gain during antenatal clinics and during childbirth have a great impact on their future birth plan <sup>13</sup>. In Pakistan and Iran, for example, majority of the mothers indicated that history of CS was the main reason that most of them opted subsequent CS. Fear of vaginal delivery amongst mothers who have a previous CS is also another reason for choice of CS as a future birth plan <sup>14</sup>.

According to Lothian, many women today have had to adopt birth plans as weapon in an adversarial struggle. This is a result of lack of trust and imbalance of power between the pregnant women and health practitioners. In most cases a birth plan is usually not an agreement between a woman and her care provider <sup>15</sup>.

### **1.2.2 Birth Plans For Women With One Previous CS**

Women's expectations for birth and preferences for mode of delivery are influenced by several factors. Knowledge of the potential benefits and risks of each mode of delivery is one of those factors. In a study in United Kingdom (UK), 45% of women with a previous caesarean preferred vaginal birth for the subsequent pregnancy, while 20% preferred an ERC. In the same study, 27% of the women had their preference determined by medical factors while 6.2% expressed no preference for mode of birth.

In a different study, 71% of women with one previous CS indicated that their birth plan was determined by the attending physician, with the women not participating in the decision making process. Most of them perceived a repeat CS as being dangerous but considered it to be less painful than vaginal delivery. Most of these women replied in the affirmative when asked whether doctors/hospitals were deliberately opting for caesarean

deliveries instead of normal vaginal deliveries. The women felt that the expenditure charged for CS was expensive. Almost all the women in this study advocated for CS to be part of antenatal clinic educational topics <sup>16</sup>.

Murphy et. al, in a study done in women in second stage of labour undergoing an emergency CS, found that most of the women with did not understand why they needed an operating delivery. The main reasons given for the CS was failure of the baby to be born. Even though this indication could be related to the size of the baby, fetal position and concern about fetal compromise, very few women were aware about the precise reason for the operative delivery <sup>17</sup>.

### **1.2.3 Cesarean Section**

Cesarean section is one of the most common operations performed on women worldwide. CS is usually performed when a vaginal delivery would more likely cause harm to either the fetus or mother or both. Evidence suggests that cesarean birth rates are high and increasing worldwide including the developing countries. Recent studies reaffirm earlier World Health Organization (WHO) recommendation about optimal C-section rates, the best outcomes of mothers and babies appear to occur with C-section rates of 5% to 10%, rates above 15% seem to do more harm than good.

For many women with one prior CS, repeat CS is the most common primary indication, accounting for 28% of births in UK and over 40% in the United States of America (USA) <sup>18</sup>. Though uncommon, uterine rupture is one of the most serious complication associated with a prior uterine surgery and can occur prior to the onset of labour or during labour<sup>19</sup>.



### **1.2.3.1 Indications For Cesarean Delivery**

Indications for cesarean section are grouped into maternal indications, fetal or both.

#### **a) Absolute Maternal Indications**

- Failed induction of labour
- Failure to progress
- Labour dystocia
- Cephalopelvic disproportion

#### **b) Relative Maternal Indication**

- Elective repeat c-section
- Maternal disease such as eclampsia with unfavorable cervix
- Situations where the increasing intrathoracic pressure generated by Valsalva maneuvers could lead to maternal complications such as dilated aortic valve root and recent retinal detachment.
- Women with a prior vaginal or perineal reparative surgery, such as colporrhaphy, ileal pouch - anal anastomosis following colostomy for inflammatory bowel disease.

#### **c) Absolute Utero-placental Indication**

- Previous uterine surgery (full thickness myomectomy)
- Prior uterine rupture
- Outlet obstruction (fibroids/cervical cancer)
- Placenta previa (Types 2b, 3, 4)
- Large placental abruption

#### **d) Relative Utero-placental Indication**

- Cord presentation in labour

#### **e) Absolute Fetal Indications**

- Fetal distress
- Cord prolapse
- Fetal malpresentation e.g. transverse lie

**f) Relative Fetal Indications**

- Maternal infection: primary genital herpes, HIV
- Fetal malpresentation: breech ,brow, compound, face
- Multiple pregnancies: the first twin in a nonvertex presentation or higher order multiples (triplets or greater)
- Fetal anomaly such as hydrocephalus

The most frequent indication for primary cesarean section is for the fetal well being (fetal intolerance to labour), followed by ‘labour complications’ (either dystocia or failure to progress in labour). Repeat cesarean section is number two contributor to rising cesarean sections.

**1.2.3.2 Factors Driving The Rise In Cesarean Deliveries**

Globally, there has been an increase in cesarean births. Prior cesarean is considered to be number one contributor to this rise. Others factors include organizational factors, mothers choices regarding childbirth and preferences for care. Also on the rise is maternal request for cesarean delivery without any maternal or fetal indications. Advance maternal age, especially for the first birth, and increased maternal Body Mass Index (BMI) have also contributed to the rise .Women having a BMI greater than 25 kg/m<sup>2</sup> are at an increased risk to cesarean delivery for both emergency and elective CS <sup>20</sup>. Another factor that may play a role in the rising CS rate is the increasing usage of intervention measures in pregnancy and childbirth. Such interventions may include intrapartum fetal heart rate monitoring and induction of labor (IOL) <sup>21</sup>. Liberal use of IOL at term in uncomplicated pregnancies contributes significantly to rising case of CS. With more births occurring in

health facilities under professionals, there is increase pressure on mothers to have cesarean deliveries. Surveys conducted in 2006 by ‘Listening to Mothers-II’ reported at least one woman in four reported feeling pressure from a health care professional to have a cesarean. Many studies attribute the increased rates of CS in the world to an increase in primary CS and decrease in VBAC.

### 1.2.3.3 Health Outcomes After Cesarean Section

Maternal complications affect not only the physical health, but also emotional wellbeing of the mother. This in turn influences a mother’s ability to care for her baby, as well as her perception of her childbirth experience. Infant complications often necessitate treatment and enforced separation, affecting early mother–infant bonding. Documented adverse health outcomes because of cesarean deliveries are many. Table 1.1 below highlights some of these outcomes.

**Table 1 Health Outcomes After Cesarean Section** <sup>22</sup>

<b>Maternal Complication</b>	<b>Percentage Risk (%)</b>
Intraoperative surgical	18
Excessive blood loss	9
Blood transfusion	1
Hysterectomy	0.3
Febrile morbidity	20
Wound Infection	6
Endometritis	6
Urinary tract infection	6
Serious infection morbidity	1
Venous thromboembolism	0.35
Severe maternal morbidity	0.3
Uterine rapture in subsequent pregnancy	1
<b>Infant Complications</b>	
Respiratory morbidity	3

Respiratory morbidity following cesarean delivery is well recognized. Neonates delivered by cesarean, particularly without the onset of labor, have increased risks of transient

tachypnea of the newborn (TTN), respiratory distress syndrome (RDS) and persistent pulmonary hypertension of the newborn (PPHN). The newborn are usually deprived maturational benefits of labor mediated by changes in endogenous steroids and catecholamines as well as the decreased active clearance of fetal lung fluid by amiloride-sensitive sodium channels (ENaC).

#### **1.2.4 The VBAC Dilemma**

Vaginal birth after cesarean (VBAC) has always been a contentious and controversial issue. Once a woman is delivered by cesarean, her options in a subsequent pregnancy are either a planned trial of labor or a planned elective repeat cesarean.

The literature on the best mode of delivery in women with one previous scars remains debateable. The most serious complication in labour with previous cesarean section is the rupture of the uterus. This is the reason why many obstetricians support ‘once a cesarean section, always cesarean’. On the other hand a study documented 69 percent successful vaginal deliveries with no maternal or fetal mortality or significant morbidity <sup>23</sup>. Continued accumulation of cases showing the efficacy of VBAC should encourage a reassessment of the continued practice of ERCS.

A study presented in Iowa conference stated that the VBAC rate peaked at 28.3% in 1996 and has progressively declined to about 7.5% in 2006 <sup>25</sup>. Non-medical factors such as financial incentives and medical legal disincentives have had a major effect on these trends. The 2010 National Institutes of Child Health and Human Conference of VBAC, after a detailed analysis of benefits compared to risks, recommended that measures should be taken to assure women that VBAC is available to them <sup>24</sup>.

ACOG (American College of Obstetricians and Gynaecologists) responded by stating that a trial of labor after cesarean (TOLAC) is a safe and appropriate choice for most women

who have had a previous cesarean. It reaffirmed the view that TOLAC is most safely undertaken where staff can immediately provide an emergency cesarean, but it also recognized that such resources are not universally available <sup>25</sup>.

Multiple studies have shown that of those women attempting TOLAC, 60-80% will result in successful vaginal births <sup>26</sup>.

Overcoming obstacles to VBAC takes commitment and hard work. To provide a safe and successful outcome with TOLAC, a specific management plan should be formulated for each patient after careful evaluation, assessment of the local setting and prelabour counseling. Checklists, practical coverage arrangements, and simulation drills are important components of labor management. This requires an organized and collaborative effort on the part of patients, physicians and hospitals.

**1.2.4.1 Predictors Of Successful VBAC**

**Table 2 Predictors Of VBAC Success Or Failure**

<b>Increased Chance Of Success</b>	<b>Decreased Chance Of Success</b>
Prior vaginal delivery	Maternal obesity
Prior VBAC	Short maternal stature
Spontaneous labor	Macrosomia
Favorable cervix	Increased maternal age (>40 y)
Nonrecurring indication (breech presentation, placenta previa, herpes)	Induction of labor
Preterm delivery	Recurring indication (cephalopelvic disproportion, failed second stage)
	Increased interpregnancy weight gain

Latina or African American race/ethnicity

Gestational age  $\geq 41$  wk

Preconceptional or gestational diabetes mellitus

#### **1.2.4.2 Contraindications To VBAC**

- Maternal request for elective repeat CS after counseling
- Maternal or fetal reasons to avoid vaginal birth in current pregnancy
- Previous uterine incision other than transverse segment including classical
- Previous complicated lower uterine segment transverse incision
- Unknown previous uterine incision
- VBAC after two or more prior lower uterine segment transverse CS is controversial
- Previous uterine rupture
- Previous hysterotomy or myomectomy entering the uterine cavity

#### **1.2.4.3 Risks Of VBAC**

Risk of failed trial of labor after cesarean (TOLAC) without a vaginal birth after cesarean (VBAC) resulting in repeat cesarean delivery (RCD) occurs in about 20 to 40 percent of women who attempt TOLAC <sup>27</sup>.

Risk of rupture of uterus results in an emergency abdominal delivery. The risk of uterine rupture may be related in part to the type of uterine incision made during the first cesarean delivery. A previous transverse uterine incision has the lowest risk of rupture (0.2 to 1.5 percent risk). Vertical or T-shaped uterine incisions have a higher risk of uterine rupture (4 to 9 percent risk) <sup>28</sup>.

The risk of fetal death is very low with both VBAC and elective repeat cesarean delivery (ERCD), but the likelihood of fetal death is higher with VBAC than with ERCS.

### **1.3 Birth Preparedness And Complications Readiness**

Planning and preparation for delivery is an essential part of antenatal care. This is usually introduced in the third trimester of pregnancy. However, in women with history of previous cesarean section, multiple gestation, bad obstetric history or concurrent medical conditions, the discussion should be introduced earlier.

The woman and her partner should be encouraged to be proactive in the decision makings of the birth plan.

Key components of birth preparedness and complication readiness include:

- Attending antenatal clinic minimum four visits
- Choosing nearest appropriate facility for delivery
- Identifying a skilled provider/ ascertaining the chosen facility has skilled provider(s)
- Arrangement for transport to get to the facility when labour sets in
- Setting aside money to cover costs of delivery
- Postpartum follow up until six weeks post delivery

All women attending the antenatal clinic should be informed about the danger signs of pregnancy and delivery.

Women who have previously under gone cesarean section might be more inclined to attempt home delivery in order to avoid repeat cesarean section. Hence it's very important to appropriately counsel and give adequate information to these women so that appropriate birth plan is in place and also complications can be appropriately managed in the event the need arises.

## CHAPTER TWO

### STATEMENT OF THE RESEARCH PROBLEM AND JUSTIFICATION

#### 2.1 Statement Of The Problem

Caesarean delivery is a frequently performed operation in women during child birth. Nevertheless, the continuous increase in the rate of CS is a major public health problem not only because it increases the health risk for mothers and babies but also because it increases the cost of health care compared to normal delivery. Increased rates of CS and their associated health and financial implications should therefore not only be a matter of concern to mothers and obstetric clinicians, but to public health officials and health management officials. Where CS is performed without any medical indication, it has the potential of adversely affecting the wellness of the mother both in the short term and long term <sup>29</sup>.

Annually, the world experiences an additional need of CS in the third world countries, where 60% of the world's births occur, ranging between 0.8 – 3.2 million CS. On the other hand, 4.0-6.2 million CS in excess are performed in developing and developed countries where 37.5% of the births occur. Studies have found these excesses to be medically unnecessary and potentially cause harm.

Rise in CS rates is seen to markedly contribute to decline in the attempts of vaginal deliveries after cesarean thus making cesarean delivery to be almost self perpetuating. It is estimated that 90% of all subsequent deliveries for mothers who have had cesarean deliveries on their first birth is usually through CS. Several studies indicate that one of the major reason for the decreased trends in VBAC is because women are not well informed of on their birth options.



Experiences the women goes through childbirth impact on her subsequent future preferred mode of delivery <sup>30</sup>. A first time experience of cesarean tends to favour their future preference of repeat CS .The purpose of antenatal preparation is so as to boost the confidence of women for childbirth and for their care of their babies. Therefore, information provided by the health care providers should be the best available evidence and guide the mother make an informed choice.

The primary step in achieving this is first assessing the adequacy of health information a woman gains during her first cesarean delivery.

## **2.2 Justification Of The Study**

Research has examined what influences women to choose VBAC or repeat CS. One study from the USA showed that the major influences were the woman's sense of control in the decision-making process based on the necessary information passed to her and the clinician's encouragement of VBAC <sup>31</sup>.

Mutiso et al in a study conducted at the antenatal care clinic at KNH noted that education and counseling on different aspects of birth preparedness was not provided to all clients. At the clinic the patients had low knowledge of the danger signs in pregnancy and many of them did not know about birth preparedness and had no plans for emergencies <sup>32</sup>.

Primary cesarean delivery today is safer than ever and because major complications are rare with the first birth, the risks of primary cesarean are not visible to practicing obstetricians. However, repeat cesareans, in particular, carry higher risks and complications and unfortunately this is not well appreciated by obstetricians and the health care providers.

According to Coulter, Parsons, and Askham, mothers who are well informed on their health conditions are able to actively participate in shared decision-making unlike the ignorant mothers who end up accepting CS for caesarean delivery for medical and even for non-medical reason without knowing true risk and benefits of the repeat CS.

### **2.3 Study Rationale**

- Outcome of this study aims to determine maternal understanding of indications and outcomes of previous cesarean section.
- This study also aims to assess whether maternal knowledge and outcome of previous cesarean section influence choice for mode of delivery in subsequent pregnancy.
- At the end this study the aim is to improve maternal education and decision making when dealing with women with one previous cesarean section at Kenyatta National Hospital.

### **2.4 Research Question**

To determine whether the maternal knowledge, indications and outcomes of previous cesarean section influence the planned mode of delivery among women with one previous cesarean section currently attending the antenatal clinic of Kenyatta National Hospital?

### **2.5 Objectives Of The Study**

#### **2.5.1 Broad Objective**

To determine whether decision on mode of delivery has been made in women with one previous cesarean section at 36-40 weeks gestation.

#### **2.5.2 Specific Objectives**

The specific objectives are:

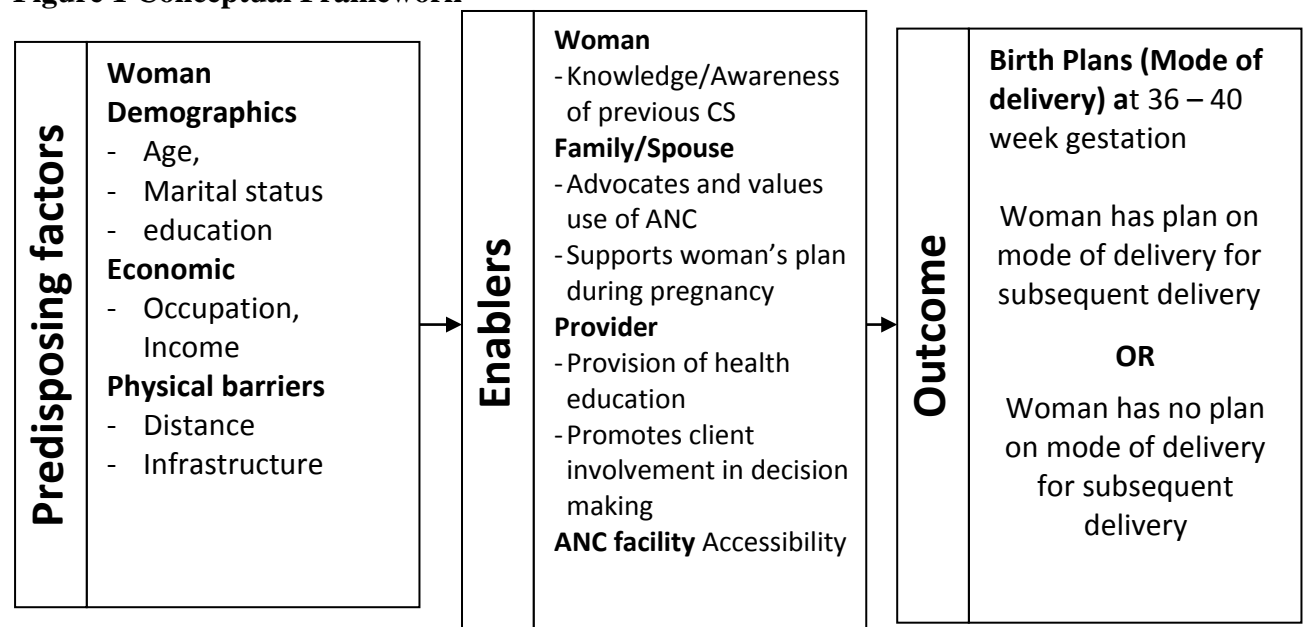
- Assess the understanding of the indication(s) for the previous cesarean section

- Determine if indications and outcomes of previous CS influence planned mode of delivery
- Determine whether women with one previous CS have a definite planned mode of delivery by 36 – 40 weeks gestation.

## 2.6 Conceptual Framework

The conceptual framework in this study is based on a determinant model focusing on a set of explanatory variables or determinants that may influence the preparation of ANC clients with a single previous CS for delivery during current pregnancy. The conceptual framework adapted from Andersen's health belief model (Andersen 1995) was modified to outline the relationship between client characteristics (predisposing factors) and conditions that facilitate (enablers) the preparation of birth plans at 36-40 weeks gestation and is presented in the below flow chart.

**Figure 1 Conceptual Framework**



**Adapted From Andersen 1995 (Modified)<sup>33</sup>**

This conceptual framework gives the factors influencing some of the aspects birth preparedness in women with one previous CS.

## **2.7 Potential Policy And Practice Implications**

The Antenatal clinic of Kenyatta National Hospital attends to around 1500 women per month. Women who are KNH clinic attendants and deliver in KNH general labour ward constitute about 45-47% while the rest are women who attended ANC in other facilities but choose KNH as their preferred facility for delivery or women who are referred from other facilities to KNH.

The Cesarean section rates in Kenya is 6% (KDHS 2008-2009).

KNH general labour ward conducts around 800 deliveries per month (KNH maternal and perinatal morbidity and mortality report 2013).

The CS rates in KNH general labour ward is around 39% (KNH maternal and perinatal morbidity and mortality report 2013).

Emergency CS done due to only one previous CS constitute about 18% of the emergency CS and 43 of the elective CS (KNH maternal and perinatal morbidity and mortality report 2013).

With these large numbers, this study might necessitate the need for guidelines in management of women with one previous cesarean section.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Study Area**

The study was conducted at the antenatal clinic of Kenyatta National Hospital. KNH is the country's largest referral hospital located in the capital city, Nairobi. It serves many patients with previous cesarean section(s) coming from most of the surrounding districts and counties in Kenya. It also has a large spectre of the socio-economic profile of patients.

The antenatal care clinic at KNH caters for expectant mothers ensuring that the mother's and baby's health is monitored, maintained and optimized to ensure a healthy pregnancy, safe delivery and post delivery care.

The antenatal clinic has obstetrician/gynecologist, senior house officers and nurses and counselors who assist mothers as well as counsel them during pregnancy. The Department of Obstetrics and Gynaecology, College of Health Sciences, University of Nairobi has also been able produce a model of focused antenatal care (FANC) at the clinic. The principle objective of FANC has been to reduce antenatal visits, provide high quality care by ensuring that each visit is comprehensively and objectively exhausted in terms of client needs.

#### **3.2 Study Design**

The study was conducted using a cross sectional design employing a quantitative approach and was based in the antenatal clinic. This was a fact finding study that sought to establish the magnitude of the problem and short comings relating to adequacy of passage of information making the study design most suitable.

### 3.3 Study Population

The study population was composed of expectant women visiting the Kenyatta National Hospital antenatal clinic and who have previously undergone one cesarean section and were at 36 to 40 weeks of gestation.

### 3.4 Study Period

The study was conducted between August 2014 and March 2015

### 3.5 Sample Design And Procedure

#### 3.5.1 Sample Size Determination

In this study all women visiting the KNH antenatal clinic who have one prior CS and in the 36<sup>th</sup> to 40<sup>th</sup> week of gestation were targeted. The sample size was determined according to Fischer et al. (1991) using the formula:

$$n = \frac{Z^2 p(1 - p)}{d^2}$$

Where n = sample size,

z = 1.96 for a confidence level of 95%,

p = the proportion of women with one previous CS who have adequate knowledge on reasons for CS and a birth plan for current delivery (estimated at 50% because the estimates were not available)

d = degree of desired precision (in this study will be 0.05) and

q = 1 - p.

Therefore:

$$n = \frac{(1.96 * 1.96) * (0.5 * (1 - 0.5))}{(0.05 * .05)}$$

= 384 women.

Considering the population of women attending KNH ANC with one previous CS at 36 to 40 weeks gestation is finite (<10,000) the following finite population correction was applied to the sample size of 384 calculated above to obtain an attainable sample estimate.

$$nf = n/(1+n/N)$$

nf = sample size adjusted for finite population

n = desired sample size

N = estimated population size (of the women attending KNH ANC app 300 women have one previous CS)

Therefore

$$Nf = 384/(1+384/300)$$

$$Nf = 169$$

Thus, a total of 169 women were recruited

### **3.6 Study Instruments**

The study instruments included questionnaire form designed in accordance to objectives of the study. Nurses in the clinic were requested to identify the study participants and a private room used for administration of the questionnaire form.

Patients who qualified for the study were informed of the purpose of the study and their consent for participation sought. The questionnaire form was administered by the principle investigator (Dr. Hodan Ahmed) or study assistant (Frida Iranga –Clinical Officer Intern at KNH) to the willing participants.

### **3.6.1 Study Recruitment Procedure**

Before recruitment of study participants, one day training was offered to a research assistant. The research assistant after the training, was expected to fully understand

- Purpose of study
- Selection of study participants
- Administration of informed consent
- Ethical guidelines of the study
- Administration of the questionnaire form

#### **3.6.1.1 Pretesting**

Pretesting of questionnaires was done for two days. The piloting was carried out in the antenatal clinic of Kenyatta National Hospital. Explicitness and analyzability of the questions were determined and terminologies deemed difficult were simplified.

#### **3.6.1.2 Study Participants**

Women who were pregnant with one previous cesarean section at 36-40 weeks gestation attending the antenatal clinic of Kenyatta National Hospital.

#### **3.6.1.3 Participants Recruitment**

Nurse in charge of the clinic was informed of the study to be conducted and purpose of the study explained. She was requested to identify the target study participants which are pregnant women with one previous CS at 36-40 weeks gestation.

Women who qualified for the study were approached for potential enrollment after they had been seen by the doctor for their antenatal visit.



A private room was used when talking to each woman.

The purpose and objectives of the study were explained to potential subjects.

Consent was then taken from those who freely agree to participate in the study.

The questionnaire form was administered to the participants by the principal investigator or trained research assistant during face to face interview.

Clarification of any question was done and translation to Kiswahili was also be done where the participant doesn't understand English

After the completion of all the questions in the questionnaire form the participant was thanked for her participation.

Each participant was seen for the administration of the questionnaires with her Kenyatta Hospital file. A green round sticker was placed on the file after administering the questionnaires. This was intended to avoid the same participant been recruited again.

This recruitment exercise was carried out on the antenatal clinic days which are Mondays, Tuesdays, Wednesdays and Thursdays 8AM to 1PM, until the target number of 169 women was attained.

### **3.6.2 Inclusion Criteria**

- Women with a single prior caesarean presenting in their next pregnancy with a live singleton pregnancy
- Women at 36 to 40 weeks of gestation

### **3.6.3 Exclusion Criteria**

- Women with concurrent medical conditions e.g. hypertension, diabetes, retroviral disease

- Previous uterine surgery (including hysterotomy or myomectomy)
- Documented fetal congenital anomalies in current pregnancy
- Less than 18 years of age

### **3.7 Sources of Bias**

Potential sources of bias on this study include:

- Recall bias – difficulty in recalling past events
- Non response bias – study participant deliberately not responding to certain questions
- Questionnaire bias – misinterpretation of question by the study participant

Bias can occur during any stage of the study:

- During study sample selection
- During study of questionnaire
- During analysis and interpretation of results
- During publication of results

Various forms of bias exist, however most of them can be categorised in one of three types:

- Selection bias
- Information bias
- Confounding bias

In this study selection bias was minimised by having inclusion and exclusion criteria and by systematic (consecutive) selection of subjects.

Information bias was been minimised by administering the questionnaire form during face to face interview and clarifying any question the study participant doesn't understand.

Allowing more time during the administration of the questionnaires might minimize the recall bias that some participants might face.

The confounders will be adjusted for in the multivariable analysis.

### **3.8 Data Collection And Data Management**

Data were collected using a semi-structured questionnaire administered to ANC clients during face-to-face interviews and designed to capture data using quantitative approaches (Appendix II). The questionnaire collected data on client characteristics, knowledge of reasons for previous CS, and the existence of a clear plan on mode of delivery.

The investigator inspected all questionnaires for completeness at the end of each interview and clarification was sought where incomplete entries existed.

All quantitative data were entered into databases designed in Microsoft Office Excel. Data cleaning was conducted to rule out outliers, check for any data entry errors, invalid and inconsistent responses as part of data quality assurance. Any errors detected were corrected through validating the entry in the database with the information contained in the questionnaire.

### **3.9 Data Analysis And Presentation**

All open ended questions were coded into categorical data before commencing analysis. Data analysis was done using SPSS software (version 19.0). The socio-demographic characteristics of ANC clients were summarized using univariate statistics. Mean and standard deviation were calculated for continuous variables including age.

The proportion of ANC clients with adequate knowledge of previous CS indications was calculated and presented as percentages. Similarly for the current pregnancy, decision on planned mode of delivery was reported as percentages. Bivariate analysis was then used to compare characteristics of participating clients according to level of awareness of CS information. Categorical factors were cross tabulated with each outcome (awareness on indication and decision on mode of delivery) in turn and comparisons of percentages done using the Chi-square or Fisher's exact test, as appropriate. Statistical significance was based on an alpha level of 0.05.

### **3.10 Ethical Considerations**

The conduct of the study was guided at all stages by the main ethical principles for conduct of research involving human subjects: informed consent, independent review, and respect for potential and enrolled subjects.

An advantage to this study was that it had no major ethical issues and no major sensitive issues.

Also no invasive procedures were involved.

#### **3.10.1 Informed Consent**

Before recruitment each eligible client was accurately informed by the investigator of the purpose, methods, risks, benefits, and alternatives to the research. The investigator then confirmed that the potential subject understands this information and how it relates to their own situation or interests. Upon confirmation of the same the clients were allowed to make a voluntary decision about whether to participate and those who decide to participate completed a signed consent form (Appendix 1).

### **3.10.2 Independent Review**

To minimize potential conflicts of interest and make sure a study is ethically acceptable before it even starts, the study protocol was submitted to KNH Ethics and Review Committee (KNHERC) and approval was obtained from the same (Appendix V). The KNHERC was informed of changes in the study title and approval for amendment to change the title was allowed (Appendix VI).

### **3.10.3 Respect For Potential And Enrolled Subjects**

The researchers respected patient privacy and kept all private information confidential, through ensuring safe storage, handling and transmission of data and stripping the data of personal identifiers e.g. patients' name or any other information that could be used to trace back the data to individual clients. Instead of personal identifiers each client was assigned a unique study serial number to be used for data collection and data management purposes. The investigator was responsible for the archiving of patient data and the study questionnaires.

The clients were informed of the right to change their mind about participation in the study without suffering any direct or indirect penalty related to the services they received at the clinic or how they are handled.

### **3.11 Limitations Of The Study**

The KNH setting, is not typical of the setting in which majority of Kenyan women attend maternity care therefore the findings of this study will not be generalized outside tertiary referral facilities.

The questionnaires were administered to the study participant. Her ability to recall distant events can greatly affect the responses she will give.

Only one time contact with the study participant might not be adequate to fully achieve all the objectives of the study.

Minors (under 18 years old) were not recruited due to the challenges and special needs of this group, consent taking being one of them.

### **3.11.1 Impact Of Study Limitations On Study Findings**

One of the study limitations is the ability of the participant to recall distant events pertaining to the information she was given on the indications of the previous CS. Her inability to recall such information will skew the findings.

The broad objective will not be impacted by the study limitations; however the findings will be exclusive to a tertiary set up and not representative of other levels of health care provision.

Finding of this study could be crucial information to consider in the management of minors with previous cesarean delivery.

## CHAPTER FOUR RESULTS

### 4.1 Socio-Demographic Characteristics

**Table 3: Socio-Demographic Characteristics Of Women With One Previous Cesarean Section Attending ANC At KNH**

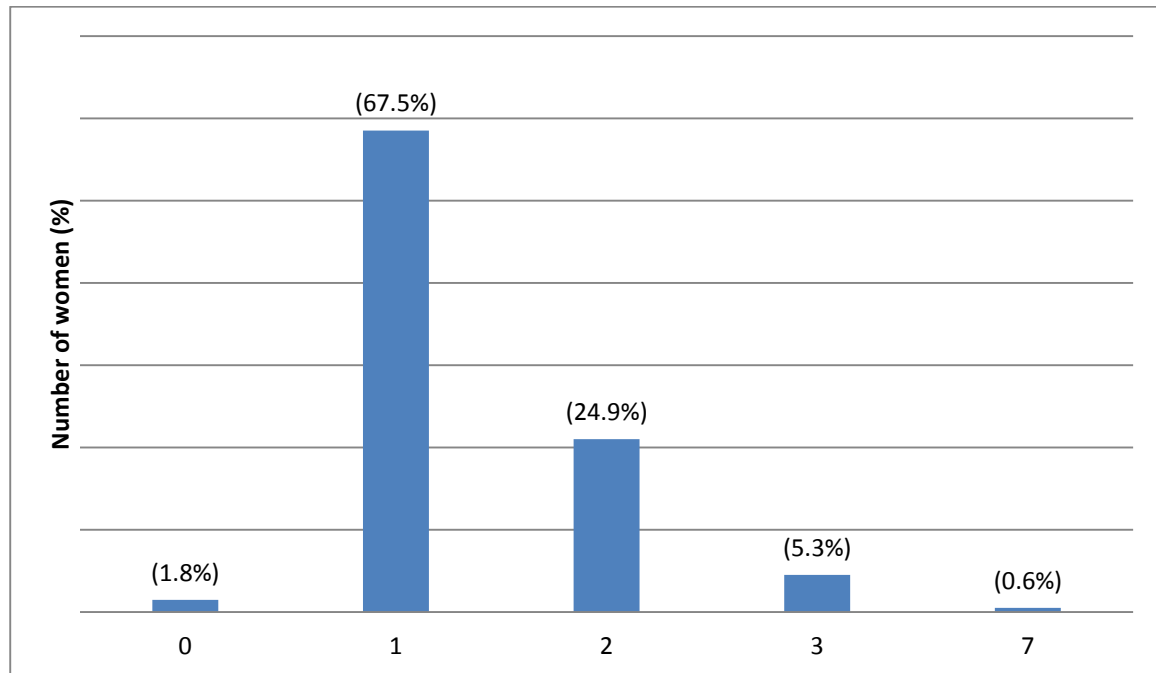
	Frequency(n=169)	Percent (%)
<b>Age in years</b>		
20-24	22	13
25-29	75	44.4
30-34	56	33.1
35-40	16	9.5
<b>Level of education</b>		
Primary	20	12
Secondary	78	46.7
College/University	69	41.3
<b>Marital status</b>		
Single	15	8.9
Married	153	90.5
Separated	1	0.6
<b>Occupation</b>		
Unemployed	60	35.5
Formal employment	55	32.5
Self-employment	54	32
<b>Monthly income</b>		
KES 0-9999	2	1.2
KES 10000-19999	61	36.1
KES 20000-49999	90	53.3
> KES 50000	16	9.4

The mean age of the mothers attending KNH ANC who had one previous scar was 29 years (SD = 4) and the age of mothers recruited ranged between 21 years and 40 years.

Table 1 shows that the modal age group for mothers with a single previous scar was 25-29 years, 75 (44.4%). The participants commonly reported having attained secondary level of education, 78 women (46.7%) and 69 women (41.3%) had college or university

qualifications. Sixty (35.5%) mothers were unemployed and 53.3% mothers reported a monthly income between KES 20,000 and 49,999.

#### 4.2 Outcomes Of Previous Deliveries



**Figure 2: Number Of Children From Previous Deliveries**

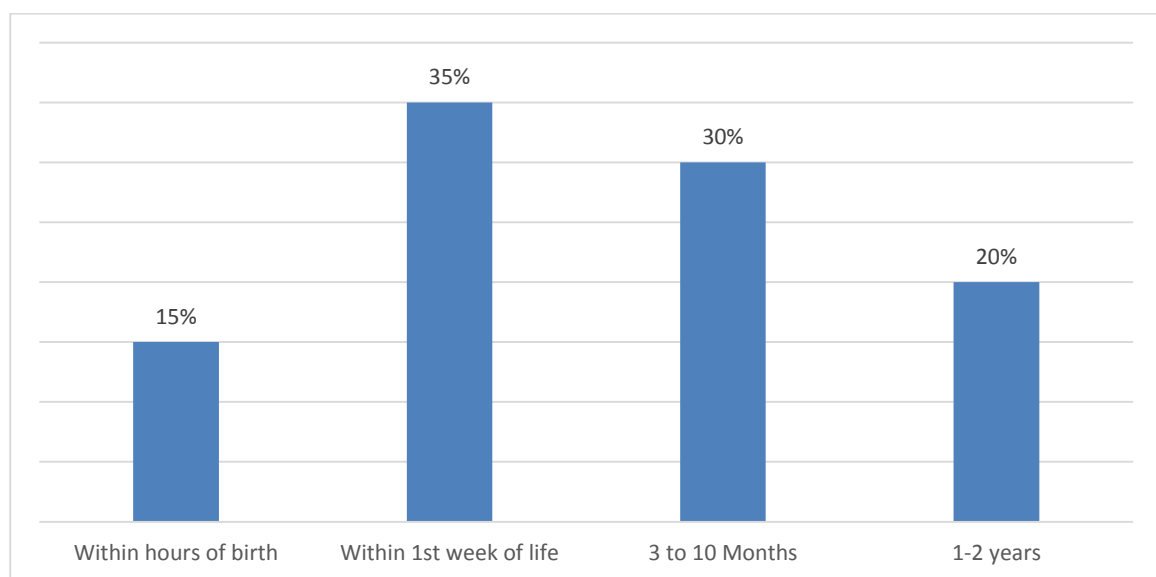
The reported number of living children ranged from 1 to 7 in the mothers with a single previous scar. At least two-thirds 117 (67.5%) of the mothers had one child and 42 (24.9%) had two children (Figure 2).



**Table 4: Delivery History For Last Pregnancy**

	<b>Frequency(n=169)</b>	<b>Percent (%)</b>
<b>Mode of delivery</b>		
Cesarean Section	167	98.8
Normal delivery	2	1.2
<b>Type of operation</b>		
Emergency	147	88.0
Elective	20	12.0
<b>Status of baby at C/S delivery</b>		
<b>Alive</b>	165	98.8
<b>Baby from last pregnancy currently alive</b>		
Yes	145	86.8
No	21	13.2

Table 4 summarizes delivery history for the last pregnancy. Most (167, 98.8%) of the mothers with a single previous scar reported that they delivered through caesarean operation during the last pregnancy prior to the index pregnancy. Of these caesarian deliveries 147 (88%) were emergency operations. There were two still births (SB) out of the 167 caesarean deliveries. 145 (86.8%) babies were reported to have survived until the time when the mothers were presenting to KNH with the index pregnancy while 21 (13.2%) deaths had occurred. The timing of these deaths are shown in Figure 3.



**Figure 3: Age Of Child At Time Of Death**

### 4.3 Indications For Previous Caesarean Section

**Table 5: Indications For Previous Caesarean Section**

	<b>Frequency (n = 169)</b>	<b>Percent (%)</b>
<b>Non recurrent indications</b>		
NRFS	44	26.0
Poor progress of labor	44	26.0
Failed induction	19	11.2
Breech presentation	22	13.0
Cord prolapse	11	6.5
<b>Recurrent indications</b>		
CPD	12	7.1
APH/ praevia	4	2.4
Self-request	3	1.8
<b>Other reasons</b>	5	3.0
<b>Unknown indication</b>	5	3.0
<b>Total</b>	<b>169</b>	<b>100.0</b>

Specific indications for previous operations are shown in Table 5. Among the non-recurrent indications for caesarean section NRFS 44(26%), poor progress 44(26%), breech presentation 22(13%), and failed induction 19(11.2%) were the most common causes of operations. The leading recurrent indications for caesarean operation were CPD 12 (7.1%) and APH/ praevia 4 (2.4%). Of the 5 mothers with other indications for operation there was a single case of maternal disease and two cases with congenital anomalies.

**Table 6: Indications For Previous CS And Decision On Mode Of Delivery**

	Decision on mode of delivery		P value
	Caesarean (n = 110)	SVD (n = 59)	
Recurrent indication	13 (65%)	7 (35%)	0.993
Non-recurrent indication	95 (66%)	49 (34%)	0.563
Unknown indication	2 (40%)	3 (60%)	0.232

The association between the main types of recurrent and non-recurrent indications for operation and the decision on mode of delivery for the index pregnancy are presented in Table 6. There were no significant association between decision on delivery mode and previous indications for operation ( $p = 0.488$ ). The percentage of mothers with a recurrent indication for operations who had a decision made to deliver through CS was 65% compared to 66% of mothers with a non-recurrent indication who were also scheduled for delivery through CS. Two (40%) of mothers with an unknown indication for previous operation had a decision made for delivery through CS.

**Table 7: Specific Recurrent And Non-recurrent Indications For Previous CS And Decision On Mode Of Delivery For Index Pregnancy**

	Decision on mode of delivery		P value
	Caesarean (n =110)	SVD (n = 59)	
<b>Non-current indications</b>			
• NRFS	26 (23.6%)	18 (30.5%)	0.332
• Poor progress of labour	33 (30%)	11 (18.6%)	0.109
• Failed induction	18 (16.4%)	1 (1.7%)	0.004
• Breech presentation	11 (10%)	11 (18.6%)	0.111
<b>Recurrent indications</b>			
• CPD	9 (8.2%)	3 (5.1%)	0.455
• APH/ praevia	1 (0.9%)	3 (5.1%)	0.089

Analysis of specific indications for previous operations presented in Table 7 showed that among the indications of operations, failed induction showed a significant association with decision made for delivery in index pregnancy. Sixteen percent of all planned operations for index delivery had previously had a failed induction compared to only one (1.7%) of the planned vaginal deliveries ( $p = 0.004$ ). Previous indications of NRFS ( $p =$

0.332), poor progress of labour ( $p = 0.109$ ) and breech presentation ( $p = 0.111$ ), were not significantly associated with decision made for delivery in index pregnancy.

**Table 8: Socio-demographic Characteristics Of Mother Who Knew Indications For CS And Those Who Didn't Know Indications For CS**

	Mother knew reason for CS in last pregnancy		P value
	Yes	No	
<b>Age in years</b>			
20-24	20(12.3)	2(50.0)	0.074
25-29	74(45.4)	1(25.0)	
30-34	54(33.1)	0(0.0)	
35-40	15(9.2)	1(25.0)	
<b>Level of education</b>			
Primary	19(11.7)	1(25.0)	
Secondary	75(46.0)	1(25.0)	
College/University	67(41.1)	2(50.0)	
<b>Marital status</b>			
Single	13(8.0)	2(50.0)	0.015
Married	149(91.4)	2(50.0)	
Separated	1(0.6)	0(0.0)	
<b>Occupation</b>			
Unemployed	58(35.6)	2(50.0)	0.838
Formal employment	52(31.9)	1(25.0)	
Self-employment	53(32.5)	1(25.0)	
<b>Monthly income</b>			
KES 0-9999	2(1.2)	0(0.0)	0.765
KES 10000-19999	59(36.2)	2(50.0)	
KES 20000-49999	87(53.4)	1(25.0)	
> KES 50000	10(6.1)	0(0.0)	

Table 8 compares the characteristic of the four mothers who did not know the reasons for the previous caesarean delivery to those mothers who were aware about reasons for delivery through caesarean section. Among the demographic characteristics compared in table 8, only marital status was significantly associated with awareness about reasons for previous caesarean ( $p = 0.015$ ). Ninety one percent of the mothers who were aware about reasons for CS were married while 2 out of the 4 mother who were unaware were also

married and the remaining 2 were single. Among the four mothers who were unaware about why they had a CS in the last delivery two were aged 20-24 years. Similarly two of these mothers had tertiary education, were unemployed and had monthly incomes between KES 10,000 and 19,999.

#### 4.4 Events Around Last Delivery (Passage Of Information)

**Table 9: Maternal Self Report Of Events Prior To And Immediately After Last CS**

##### **Delivery**

	<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>Signed consent before operation</b>	151	89.3
<b>Consent signed by a family member</b>		
Yes	7	46.7
No	5	33.3
Don't know	3	20
<b>Discussed mode of next delivery with doctor/ nurse prior to discharge</b>	19	11.2
<b>Options for next delivery</b>		
Operation	3	16.7
Normal delivery or operation	15	83.3
<b>Reported complications following surgery</b>	5	3

The processes that were followed during the last pregnancy were explored and are presented in table 9. Most (89.3%) mothers reported signing a consent form prior to undergoing operation, and of those who did not sign 46.7% reported that a relative signed consent on their behalf. Nineteen mothers discussed options of next delivery with health workers prior to discharge and 15 (83.3%) reported that both normal delivery and operations were possible modes of delivery. Five (3%) mothers developed complications following surgery (wound sepsis in four mothers and keloids in one mother).

#### 4.5 Mode Of Delivery

**Table 10: Decision On Planned Mode Of Delivery For Women With One Previous CS**

	<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>Client knows the expected date of delivery</b>		
Yes	143	84.6
No	26	15.4
<b>Doctor/ nurse discussed options on mode of delivery</b>	169	100
<b>Decision on delivery mode has been made</b>	169	100
<b>Decision on delivery made:</b>		
Normal delivery	59	34.9
Operation	110	65.1
<b>Preferred mode of delivery:</b>		
Normal delivery	50	29.6
Operation	119	70.4

All the 169 mothers reported that a decision had been made on the delivery mode for the index pregnancy and this decision had followed a discussion with a doctor or nurse in all 169 (100%) cases. Despite having held discussions on mode of delivery and decided on a mode of delivery, only 143 (84.6%) mothers reported that they knew the expected date of delivery. Most (110, 65.1%) of mothers were scheduled for caesarean delivery and 119 (70.4%) reported that they preferred delivery through operation.

**Table 11: Preferred Mode Of Delivery And Decision Made On Mode of Delivery**

	Decision made on delivery mode	
	CS	Normal
Preferred mode of delivery		
CS	95(79.8%)	24(20.2%)
Normal	15(30%)	35(70%)

In 130 (76.9%) mothers the decision made regarding mode of delivery corresponded with the stated preference for delivery in the index pregnancy (Table 11). Fifteen (30%) of mothers with a stated preference for normal delivery were scheduled to deliver through operation while 20 (20.2%) of mothers who preferred operation were scheduled for normal delivery.

Overall concordance between preference and decision on mode of delivery was 76.9% (95% CI 69.8-83%). Concordance for delivery was 86.3% and concordance for CS was 59.3%



**Table 12: Maternal Characteristics And Existence Of Plan On Mode Of Delivery In Women With Single Previous Scar In KNH**

	Plan on mode of delivery		P value
	Yes	No	
<b>Age in years</b>			
20-24	20(14.0)	2(7.7)	0.185
25-29	60(42.0)	15(57.7)	
30-34	47(32.9)	9(34.6)	
35-40	16(11.2)	0(0.0)	
<b>Level of education</b>			
Primary	16(11.2)	4(15.4)	0.805
Secondary	67(46.9)	11(42.3)	
College/University	58(40.6)	11(42.3)	
<b>Marital status</b>			
Single	13(9.1)	2(7.7)	0.886
Married	129(90.2)	24(92.3)	
Separated	1(0.7)	0(0.0)	
<b>Occupation</b>			
Unemployed	49(34.3)	11(42.3)	0.714
Formal employment	47(32.9)	8(30.8)	
Self-employment	47(32.9)	7(26.9)	
<b>Income</b>			
KES 0-9999	2(1.4)	0(0.0)	0.474
KES 10000-19999	50(35.0)	11(42.3)	
KES 20000-49999	75(52.4)	15(57.7)	
> KES 50000	10(7.0)	0(0.0)	

The maternal characteristics examined and presented in table 12 did not show significant associations with existence of planned mode of delivery for the index pregnancy: age (p = 0.185), education (p = 0.805), marital status (p = 0.886), occupation (p = 0.714) and income (p = 0.474).

**Table 13: Attributes Of Previous CS And Existence Of Plan On Mode Of Delivery In Index Pregnancy**

	<b>Existence of plan on mode of delivery</b>		<b>P value</b>
	<b>Yes</b>	<b>No</b>	
<b>Type of previous caesarean operation</b>			
Emergency	125(87.4)	23(88.5)	0.95
Elective	17(11.9)	3(11.5)	
<b>Doctor/ nurse discussed mode of next delivery</b>			
Yes	18(12.6)	1(3.8)	0.194
No	125(87.4)	25(96.2)	
<b>Number of children</b>			
One child	100(69.9)	14(53.8)	0.138
2 or more children	41(28.7)	11(42.3)	

When respondents were asked about pregnancy intentions and satisfaction with ANC services at KNH, 66 (39.1%) mothers reported that they were planning to have more children and 162 (95.9%) mothers were satisfied with the services that had been offered at the ANC clinic.

## **CHAPTER FIVE**

### **DISCUSSION AND CONCLUSION**

#### **5.1 Discussion**

The aim of the current study conducted among women attending care in an urban tertiary referral facility in Kenya was to determine decision making on planned mode of delivery among women with one previous scar. It was established that a decision on mode of delivery had been made for all mothers at 36-40 weeks gestation and that mothers were involved in decision making. The rates of definitive plan and decision making reported in ANC mothers with a previous scar at KNH during the current study is higher than reported in a similar study conducted previously in Pakistan <sup>34</sup>. While both studies report the involvement of women in decision making on mode of delivery, the previous study reports that decision on mode of delivery was commonly taken jointly by women and doctors but at times the decision was taken by women alone. In contrast, our study reports that all decisions on mode of delivery followed discussions with medical personnel (doctor in the antenatal clinic). The role of health workers in decision making among women with a previous scar cannot be overemphasized. In fact in-depth qualitative reports document that women are uncomfortable with having responsibility for decision making and prefer targeted information and guidance from medical personnel to aid decision on how to deliver in the current pregnancy <sup>35</sup>.

It is noteworthy that although all participating women in KNH reported that a decision had been made on mode of delivery at 36-40 weeks and that a health worker was involved still approximately 15% of women did not know the expected date of delivery. This is a major concern because it could have a direct impact on time of delivery and pregnancy

outcome especially in low income countries with health systems characterized by referral delays related to poor emergency medical response <sup>36</sup>.

The overall concordance between preferred mode of delivery and decision made on mode of delivery was 76.9%. Agreement on spontaneous vaginal delivery was higher than for cesarean section. In our study, the reasons for disagreement between women and health workers on the preferred mode of delivery were not explored. From the perspective of women previous negative birth experience and fear of birth process have been identified as possible non-medical determinants of cesarean section. Separately and related to health worker and women concordance on mode of delivery, it has been reported in previous studies that a fulfilled request on mode of birth does not guarantee a positive birth experience <sup>37</sup>. The lower concordance on cesarean section could plausibly be linked to women who consider a caesarean section where no medical indication is present. For this group it has been suggested that ANC information on all aspects of cesarean section could help in improving agreement between health workers and patients. An alternative explanation could be the inability of patients to distinguish between recurrent and non-recurrent indications for caesarean sections.

Most women attending KNH ANC reported that they knew the indications for previous cesarean section. The non-recurrent indications for cesarean section were more prevalent than recurrent causes of cesarean sections agreeing with previous studies in Kenya and more widely in Sub Saharan Africa on the indications of cesarean sections <sup>38,39</sup>. The percentage of mothers reporting that they knew the reasons for previous cesarean is higher than reported in other studies <sup>40</sup>. In fact, even in high income countries just over half of the women delivering at teaching and referral facilities reported that they were not debriefed on the reasons for their caesarean section before their discharge from hospital.

Possible explanations for the apparently high levels of knowledge for cesarean indications include the reliance of the present study on maternal self-report with no validation of responses from medical case records.

There was no association between knowledge on the indications (recurrent indications for previous CS) and planned ERCS. The concordance for recurrent indications and ERCS was 59.3%. This implies poor decision making as far as choosing appropriate mode of mode of delivery for women with one previous CS. Protocols and checklists can be designed that can help clinicians and mothers make appropriate decision on mode of delivery.

The outcomes of previous CS did not influence mode of delivery in the index pregnancy.

## **5.2 Conclusion**

In women with one previous caesarean section the level of knowledge on reasons that indicated previous caesarean section is high. Often the recurrent indications do not influence decision on mode of delivery for next pregnancy and failed induction of labor was the only identifiable indication that influenced decision on delivery mode during the next pregnancy. There is considerable discordance between health worker and patient agreement on the mode of delivery for pregnancies following a single previous scar.

Few women were not aware of their due date however all the women in this study had a definitive plan on mode of delivery.

## **5.3 Recommendation**

Based on the findings regarding women involvement in decision making on mode of delivery following a previous scar the current study makes the following recommendations.

Firstly, despite the demonstrably high levels of understanding of indications for previous caesarean section, a small proportion of women still do not understand reasons for caesarean section. There is need to promote and implement sustained debriefing sessions after delivery through caesarean section to raise awareness on the reasons for caesarean section in this group of patients. The sessions should take cognisance of the individual patient information requirements in addition to the standardized information delivered during such sessions.

Secondly, health workers should highlight the important influence that recurrent indications of cesarean section have on decision making regarding mode of delivery to help standardise practice.

Thirdly, health workers should sustain efforts that were documented in this study to ensure that timely and definite planned modes of delivery are made in collaboration with the expectant mother by 36-40 weeks.

Finally, it is recommended that ANC client-health worker discussions on mode of delivery should incorporate additional information that mothers were unaware of and yet could impact on delivery outcomes. A case in point is expected date of delivery found to be inadequately communicated to mothers.

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## APPENDICES

### APPENDIX I: INFORMED CONSENT

I am Dr. Hodan Ahmed, a postgraduate student in the department of obstetrics and gynecology in the University of Nairobi. I am carrying out a study as part of the requirement for Master of Medicine in Obstetrics and Gynaecology.

**Study Title:** Influence of the indications and outcomes of previous cesarean section on planned mode of delivery in women with one previous cesarean section.

**Principal Investigator:** Dr. Hodan Ahmed, Tel 0722 902 445

**Supervisors:**

1. Prof. Qureshi Zahida, Associate Professor of Obstetrics and Gynaecology, Department of Obstetrics and Gynaecology, University
2. Prof. Koigi Kamau, Associate Professor of Obstetrics and Gynaecology, Department of Obstetrics and Gynaecology, University

**Purpose Of Study:** To find out whether women with one previous cesarean operation have a decision on mode of delivery by 36 weeks to 40 weeks

**Study Procedure:** The information will be collected using a structured questionnaire that will be administered by the principal investigator (Dr Hodan) or research assistant to the study participant.

All information collected in this study will be treated and kept confidential and in the custody of Dr. Hodan Ahmed only.

The data will then be analysed to determine the objectives of the study.

Study approval has been given by the Kenyatta National Hospital/University of Nairobi ethics committee {KNH/UON-ERC}.

I am requesting your participation in this study. I would like to bring to your attention the following ethical considerations which will guide your participation.

1. Participation in this study is purely voluntary.
2. This study carries no extra risk or cost to you.
3. You may withdraw at any point of the questionnaire filling and there won't be any consequences for your decision to withdraw.
4. Any information you provide including details on your demographic characteristics will be treated as confidential.

5. There is no compensation or benefits for participating in this study; you will receive the same standard of care as any other person attending this clinic.

Signing the consent form indicates that you have read the consent form, that your questions have been answered to your satisfaction, and that you voluntarily agree to participate in this research study. You will receive a copy of the signed consent form.

**For Further Information Please Contact:**

Dr. Hodan Ahmed

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OR

Kenyatta National Hospital / UoN Ethics

Committee

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**CONSENT FORM**

I, the undersigned, do hereby consent to participate in this study whose nature, purpose and objectives have been fully explained to me. I am aware that participation is voluntary and that there are no consequences to withdrawal from the study. I have been informed that all data provided will be used for the purposes of study only.

Signed.....

Date.....

I,.....declare that I have adequately explained to participant the purpose of the of the study and the procedures. I have given the participant time to ask questions and seek clarification regarding the study.

Signed.....

Date.....

## APPENDIX II

### DATE COLLECTION (QUESTIONNAIRE) FORM

Participant No.....

1. What is your age ..... years?
2. What is your educational level?
  - a) None
  - b) Primary
  - c) Secondary
  - d) College/university
3. What is your marital status?
  - a) Single
  - b) Married
  - c) Separated
  - d) Divorced
  - e) Widowed
4. What is your occupation?
  - a) Unemployed
  - b) Formal employment
  - c) Self employment
5. What is your monthly income/ combined income?
  - a) KES0 - 9,999
  - b) KES10,000 - 19,999
  - c) KES20,000 - 49,999
  - d) More than KES50,000
6. How many children do you have? Write down .....
7. Did you deliver by operation (Cesarean section) in your last pregnancy?
  - a) Yes
  - b) No
8. Was it an emergency operation or scheduled (planned) operation?
  - a) Emergency
  - b) Scheduled



9. The baby, born by the cesarean section (operation) you had, at time of delivery was alive or dead?
- a) Alive
  - b) Dead
10. Is that baby alive now?
- a) Yes
  - b) No
11. If the baby is NOT alive, how old was the baby at time of death? Specify in days/months or years .....
12. When was the operation (cesarean section) you had? Specify month and year .....
13. Did you understand why you had to undergo the cesarean section (operation)?
- a) Yes
  - b) No
14. If yes, what was the reason (indication)? Write down .....
15. If no, who influenced the cesarean section (operation)? Write down .....
16. Did you sign a consent form before going to theatre?
- a) Yes
  - b) No
17. If No, has a family member signed on your behalf?
- a) Yes
  - b) No
  - c) I don't know
18. After the operation at that time, before discharge from the hospital, has the doctor/nurse discussed with you on options on mode of delivery in the next pregnancy?
- a) Yes
  - b) No
19. If yes, what options are there on the mode of delivery for the next delivery?
- a) Normal delivery
  - b) Operation
  - c) I don't know

20. Did you have any complications after the surgery?
- Yes
  - No
21. If yes, specify .....
22. How old was your this pregnancy by the time you made your first antenatal clinic (here or another facility)?
- Less than 3 months
  - 3 – 5 months
  - 5 - 7 months
  - More than 7 months
23. How many antenatal visits have you had so far for this pregnancy (total)? .....
24. Do you know your expected date of delivery?
- Yes.
  - No
25. If yes, specify .....
26. For this current pregnancy, has any doctor discussed with you on how you will be delivered?
- Yes
  - No
22. Has a decision been made on how you will be delivered?
- Yes
  - No
23. If Yes, decision is:
- Normal delivery (Trial of labour)
  - Operation
24. How do you prefer to deliver?
- Normal delivery
  - Operation
25. Do you plan to have more children?
- Yes
  - No
26. Are you satisfied with the services in this clinic?
- Yes
  - No



## APPENDIX III

### APPROVAL FROM KNH/UON-ERC



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Ref: KNH-ERC/A/392      Link: [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)      17<sup>th</sup> December 2014

Dr. Hodan Ahmed Mohamed  
Dept. of Obs/Gynae  
School of Medicine  
University of Nairobi

Dear Dr. Mohamed

**RESEARCH PROPOSAL: ASSESSMENT OF MATERNAL PREPAREDNESS FOR BIRTH IN WOMEN WITH ONE PREVIOUS CESAREAN SECTION (P597/10/2014)**

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 17<sup>th</sup> December 2014 to 16<sup>th</sup> December 2015.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study  
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN).

“Protect to Discover”

## APPENDIX IV

### APPROVAL FOR TITLE MODIFICATION FROM KNH/UON-ERC



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Ref: KNH-ERC/ MOD/162

12<sup>th</sup> May, 2015

Dr. Hodan Ahmed Mohamed  
Dept. of Obs/Gynae  
School of Medicine  
University of Nairobi

Dear Dr. Hodan

Re: Approval of modification – Assessment of Maternal Preparedness for Birth in Women with one Previous Cesarean Section (P597/10/2014)

Refer to your communication of 16<sup>th</sup> April, 2015.

The KNH/UoN-ERC has reviewed and approved modification of the following:

1. Amendment to change the title of your study to read "Influence of the indications and outcomes of previous cesarean section on planned mode of delivery in women with one previous cesarean section"

Yours sincerely,

  
PROF. M. L. CHINDIA  
SECRETARY, KNH/UON-ERC

c.c. The Principal, College of Health Sciences, UoN  
The Deputy Director CS, KNH  
The Chair, KNH/UoN-ERC

